3.2.6 CONNECTORS:

3.2.6.1 RF OUTPUT CONNECTOR SHALL BE HERMETIC, GOLD PLATED, FEMALE SMA SEALECTRO PART NUMBER (PN) 50-643-7580-31 (ROCKWELL COLLINS PART NUMBER (RCPN) 357-0551-010) OR A ROCKWELL COLLINS APPROVED EQUIVALENT (J1).

3.2.6.2 POWER CONNECTOR SHALL BE HERMETIC, 5-PIN, MALE WITH GOLD PLATED PINS AND NORMAL POLARITY LOCKING HARDWARE, HERMETIC SEAL CORP. PN S5904-5PSL (RCPN 371-2649-020) OR A ROCKWELL COLLINS APPROVED EQUIVALENT (J2).

3.2.7 MARKINGS: THE UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, MANUFACTURER'S PART NUMBER, FREQUENCY IN MHz (MEGAHERTZ), SERIAL NUMBER AND ROCKWELL COLLINS PART NUMBER. MARKINGS SHALL BE ON THE OPPOSITE SIDE OF OSCILLATOR FROM THE MOUNTING HOLES.

3.2.8 PIN CONNECTIONS:

PIN NO.	FUNCTION
1	A. V_1
2	B. DC AND CASE GND
3	C. BIT OUTPUT
4	D. V_2
5	E. SPARE

3.3 ENVIRONMENTAL: UNITS SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF 3.1 AND 3.2 SPECIFIED HEREIN SUBSEQUENT TO THE FOLLOWING ENVIRONMENTAL TESTS. DURING THESE TESTS THE UNITS SPECIFIED NORMAL MOUNTING MEANS SHALL BE USED.

3.3.1

REQUIREMENTS:	TEST PARAGRAPH:
SHOCK	4.5.1
VIBRATION	4.5.2
SALT SPRAY	4.5.3
HERMETIC SEAL	4.5.4
BURN-IN	4.5.5
THERMAL SHOCK	4.5.6
ALTITUDE	4.5.7
MOISTURE RESISTANCE	4.5.8

3.3.2 VIBRATION: DURING THE VIBRATION TEST SPECIFIED IN 4.5.2 HEREIN UNITS SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF 3.1 AND 3.2 HEREIN WITH THE EXCEPTION OF 3.1.4.8, 3.1.6.2, AND 3.1.6.3 HEREIN.

3.3.3 AMBIENT TEMPERATURE: OPERATING: -54°C TO +85°C.
STORAGE: -62°C TO +125°C.

3.3.4 ALTITUDE: OPERATING: -1500 FEET MEAN SEA LEVEL (MSL) TO 80,350 FEET MSL MINIMUM.

3.3.5 NUCLEAR HARDNESS REQUIREMENTS: IN ADDITION TO CONFORMING TO THE ELECTRICAL REQUIREMENTS INITIALLY, THE UNIT SHALL BE CAPABLE OF CONFORMING TO THE REQUIREMENTS OF THIS DRAWING, EXCEPT AS SPECIFIED IN 3.3.5.4, 3.3.5.5 AND 3.3.5.6 HEREIN, AFTER SUBJECTION TO ANY OF THE FOLLOWING NUCLEAR RADIATION LEVELS TESTED AT THE OPTION OF THE PROCURING ACTIVITY. REFERENCE 4.5 HEREIN AND ROCKWELL COLLINS DRAWING (646-0918-001) WHICH CONTAIN DEFINITION OF THE FOLLOWING LEVELS.

3.3.5.1 TOTAL DOSE: LEVEL E.

3.3.5.2 NEUTRON: LEVEL L.

3.3.5.3 DOSE RATE: LEVEL E.

3.3.5.4 FREQUENCY SHIFT DUE TO RADIATION: $\pm 1.0 \times 10^{-7}$ MAXIMUM.

3.3.5.5 OUTPUT POWER AFTER RADIATION: -3dBm TO +2dBm INTO A 50 OHM $\pm$5% RESISTIVE LOAD.

3.3.5.6 WARM-UP TIME AFTER RADIATION: FROM A SIX HOUR COLD SOAK START AT -40°C, THE FREQUENCY AFTER 5 MINUTES SHALL BE WITHIN 3×10^{-8} OF THE FREQUENCY AFTER 30 MINUTES. THE RATE OF CHANGE OF FREQUENCY AFTER 5 MINUTES SHALL NOT EXCEED 1×10^{-9}/SECOND.

3.3.6 RADIATION HARDENING (COMPONENT LEVEL): CRYSTAL UNITS SHALL INCORPORATE "SWEPT" QUARTZ MATERIAL.

SEMICONDUCTORS HAVING LOW SURVIVABILITY TO NUCLEAR EXPOSURE SHALL NOT BE INCORPORATED, SUCH AS SCR'S, NMOS, AND SOME CMOS DEVICES.

CURRENT LIMITING SHALL BE INCORPORATED SO AS TO PROTECT SEMICONDUCTORS AND OTHER COMPONENTS FROM NUCLEAR INDUCED PHOTOCURRENT EFFECTS.

3.4 RELIABILITY REQUIREMENTS:

3.4.1 THE MATURE MEAN TIME BETWEEN FAILURES (MTBF) SHALL BE 30,000 HOURS MINIMUM IN AN AIRBORNE UNINHABITED FIGHTER ENVIRONMENT. MTBF SHALL BE DETERMINED USING A ROCKWELL COLLINS APPROVED PLAN.

4.0 QUALITY ASSURANCE PROVISIONS:

4.1 QUALITY CONFORMANCE INSPECTION: (-010, -020 ONLY) THE SUPPLIERS SHALL BE RESPONSIBLE FOR THOSE IN-PROCESS CONTROLS AND INSPECTIONS NECESSARY TO ACHIEVE A PRODUCT CONSISTENTLY CONFORMING TO THE REQUIREMENTS OF THIS DRAWING. AT A MINIMUM, QUALITY CONFORMANCE INSPECTION SHALL CONFORM TO THE REQUIREMENTS OF MIL-O-55310, GROUPS A, B, AND C EXCEPT THAT GROUP A TESTS DO NOT HAVE TO BE DONE IN THE ORDER SPECIFIED IN MIL-O-55310. GROUP A, B, AND C TESTS MAY BE DONE IN PARALLEL AT THE DISCRETION OF THE SUPPLIER. FOR GROUP C, THE SEAL TEST AND ELECTRICAL TESTING MAY BE PERFORMED IN ANY ORDER AT THE END OF THE SUBGROUPS EXCEPT FOR THE OPERATING VIBRATION TESTING WHICH SHALL AS A MINIMUM HAVE OUTPUT FREQUENCY, OUTPUT POWER, HARMONIC AND SUBHARMONIC DISTORTION, AND SPURIOUS RESPONSE TO VIBRATION DURING THE SPECIFIED VIBRATION PROFILES. IN ADDITION, GROUP C TESTING SHALL INCLUDE THE FOLLOWING TESTS:

REQUIREMENT	PARAGRAPH
ACCELERATION SENSITIVITY	3.1.4.8
PHASE NOISE DENSITY	3.1.6.3
RESPONSE TO VIBRATION	3.1.6.4

(-030 ONLY) THE SUPPLIERS SHALL BE RESPONSIBLE FOR THOSE IN-PROCESS CONTROLS AND INSPECTIONS NECESSARY TO ACHIEVE A PRODUCT CONSISTENTLY CONFORMING TO THE REQUIREMENTS OF THIS DRAWING.

4.1.1 QUALITY CONFORMANCE LOT DEFINITION: (-010, -020 ONLY) A LOT IS DEFINED AS A GROUP OF DEVICES OFFERED FOR INSPECTION, MANUFACTURED WITHIN A 12 WEEK PERIOD USING THE SAME PARTS, MATERIALS, PROCESSES AND DESIGN. THE VENDOR SHALL ESTABLISH TRACEABILITY FROM THE QUALITY CONFORMANCE LOT TO THE PRODUCTION LOT. RESULTS OF THE QUALITY CONFORMANCE LOT WILL BE REVIEWED AND APPROPRIATELY APPLIED TO THE PRODUCTION LOT. A LOT MAY BE BROKEN INTO SUBLOTS TO FACILITATE DELIVERY.

SAMPLES FOR QUALITY CONFORMANCE INSPECTION SHALL BE RANDOMLY SELECTED FROM SUBLOTS WHEN PRESENTED FOR QUALITY CONFORMANCE INSPECTION. THE VENDOR SHALL MAINTAIN RECORDS WHICH RELATES THE QUALITY CONFORMANCE GROUP TESTING RESULTS TO THE PRODUCTION LOT AND SUBLOT (BY DATE CODE AND/OR SERIAL NUMBER) WHICH IT SATISFIES. GROUP A AND B SUBLOT SAMPLE TESTS SHALL BE SUCCESSFULLY COMPLETED PRIOR TO SHIPMENT OF THE SUBLOT. THE VENDOR SHALL PROVIDE TO THE PROCURING ACTIVITY WRITTEN CONFIRMATION THAT GROUP A AND B TESTING HAS BEEN COMPLETED. THE CONFIRMATION SHALL INCLUDE A LIST OF ALL SERIAL NUMBERS THAT CONSTITUTE THE LOT. THE QUANTITY SUBJECTED TO GROUP A AND B TESTING, THE QUANTITY THAT PASSED/FAILED AND STATEMENT OF COMPLIANCE THAT THE LOT PASSED/FAILED THE GROUP A AND B TESTS.

4.1.2 SUPPLIER QUALIFICATION: IN ORDER TO BE AN APPROVED SUPPLIER TO THIS DRAWING, THE SUPPLIER SHALL PROVIDE WRITTEN OBJECTIVE TEST DOCUMENTATION, FOR THE CONFIGURATION BEING SUPPLIED, WHICH DEMONSTRATES COMPLIANCE TO THE REQUIREMENTS OF 3.0 HEREIN. INITIAL QUALIFICATION SHALL CONSIST OF 4.1 HEREIN AND ADDITIONAL TESTING OR ANALYSIS AS REQUIRED BY THE QUALIFYING ACTIVITY TO VERIFY SUBPARAGRAPHS OF 3.0 HEREIN. THE PROCURING ACTIVITY OF THIS PART RESERVES THE RIGHT TO PERFORM ANY OF THE REQUIRED VERIFICATION TESTS.

4.2 SCREENING REQUIREMENT: SUBSEQUENT TO THE FOLLOWING SCREENING TESTS, PERFORMED IN THE ORDER SHOWN, THE UNITS SHALL BE 100 PERCENT ELECTRICALLY TESTED FOR COMPLIANCE WITH THE REQUIREMENTS LISTED IN TABLE II. TEST DATA SHALL BE SUPPLIED (IDENTIFIED BY SERIAL NUMBER) WITH EACH UNIT DELIVERED.

TEST	PARAGRAPH
BURN-IN	4.5.5
THERMAL SHOCK	4.5.6

4.3 DESIGN CHANGE APPROVAL: ANY CHANGES IN THE DESIGN, PARTS, PROCESSES, OR THE MATERIALS AFFECTING FORM, FIT, OR FUNCTION OF THE PART DESCRIBED HEREIN, OR CHANGES TO THE ACCEPTANCE TEST PROCEDURES, SUBSEQUENT TO DELIVERY OF ENGINEERING SAMPLES OR PRODUCTION FIRST ARTICLES, MUST BE APPROVED BY THE COGNIZANT PROCURING ACTIVITY PRIOR TO THE INCORPORATION OF THE PROPOSED CHANGES.

4.4 NUCLEAR HARDNESS ASSURANCE REQUIREMENT: DEVICES SUPPLIED TO THIS DRAWING SHALL MEET THE NUCLEAR HARDNESS REQUIREMENT LEVELS SPECIFIED IN ROCKWELL COLLINS DRAWING (646-0918-001) AND 3.3.5 HEREIN. THIS DRAWING IS CLASSIFIED AND IS ON FILE AT THE ROCKWELL COLLINS SECURITY OFFICE. NECESSARY VISIBILITY TO THE CLASSIFIED LEVELS MAY BE OBTAINED BY COORDINATION WITH THE ROCKWELL COLLINS SECURITY OFFICE.

4.5 TEST PROCEDURES:

4.5.1 SHOCK: UNITS, NONOPERATING, SHALL BE TESTED IN ACCORDANCE WITH MIL-STD-202, METHOD 213, TEST CONDITION I (100 G'S, 6 MILLISECONDS, SAWTOOTH).

4.5.2 VIBRATION:

4.5.2.1 VIBRATION (SINEWAVE): UNITS, OPERATING, SHALL BE TESTED IN ACCORDANCE WITH MIL-STD-202, METHOD 204, TEST CONDITION G (.06" DOUBLE AMPLITUDE FROM 10-100 Hz, 30 G FROM 100-2000 Hz).

4.5.2.2 VIBRATION (RANDOM): PERFORMANCE/OPERATIONAL: 1 1/2 HOURS IN EACH OF 3 PLANES; SEE APPLICABLE FIGURES FOR VIBRATION PROFILES.

ENDURANCE/NONOPERATIONAL: 1 HOUR IN EACH OF 3 PLANES, SEE APPLICABLE FIGURES FOR VIBRATIONAL PROFILES.

4.5.3 SALT SPRAY: UNITS, NONOPERATING, SHALL BE TESTED IN ACCORDANCE WITH MIL-STD-202, METHOD 101, TEST CONDITION B.

4.5.4 HERMETIC SEAL: UNITS, NONOPERATING, SHALL BE TESTED IN ACCORDANCE WITH MIL-STD-202, METHOD 112, TEST CONDITION D.

4.5.5 BURN-IN: ALL UNITS SHALL BE SUBJECTED TO 20 POWER ON-OFF CYCLES CONSISTING OF 15 MINUTES WITH POWER APPLIED AND 30 MINUTES WITHOUT POWER APPLIED AT ROOM AMBIENT TEMPERATURE. IN ADDITION, ALL UNITS SHALL BE ENERGIZED FOR A MINIMUM OF 160 HOURS WITH A 50 OHM $\pm$10% LOAD AT A TEMPERATURE OF +80°C $\pm$5°C. OPERATING VOLTAGES SHALL BE 20 $\pm$1 VDC FOR V_1 AND 15 $\pm$1 VDC FOR V_2.

4.5.6 THERMAL SHOCK: ALL UNITS, NONOPERATING, SHALL BE SUBJECTED TO 25 THERMAL CYCLES FROM -50°C $\pm$5°C TO +90°C $\pm$5°C WITH A 1/2 HOUR MINIMUM DWELL AT EACH TEMPERATURE. THE TRANSITION TIME FROM COLD TO HOT AND HOT TO COLD SHALL BE LESS THAN 15 MINUTES. UNITS SHALL BE NONOPERATING THROUGHOUT THIS TEST.

4.5.7 ALTITUDE: UNITS, NONOPERATING, SHALL BE TESTED IN ACCORDANCE WITH MIL-O-55310 AND MIL-STD-202, TEST CONDITION C, EXCEPT ALTITUDE SHALL BE 80,350 FEET.

4.5.8 MOISTURE RESISTANCE: UNITS, NONOPERATING, SHALL BE TESTED IN ACCORDANCE WITH MIL-O-55310.

5.0 PREPARATION FOR DELIVERY: PARTS SHALL BE PACKAGED IN A MANNER THAT WILL AFFORD ADEQUATE PROTECTION AGAINST CONTAMINATION, CORROSION, DETERIORATION AND PHYSICAL DAMAGE. PARTS SHALL BE PACKAGED SO THEY WILL BE EASILY ACCESSIBLE WITHOUT DAMAGING THE PARTS.

6.0 NOTES: THE INFORMATION CONTAINED IN THIS SECTION IS FOR REFERENCE ONLY.

6.1 IDENTIFICATION OF THE SUGGESTED SOURCE(S) OF SUPPLY HEREON IS NOT TO BE CONSTRUED AS A GUARANTEE OF PRESENT OR CONTINUED AVAILABILITY AS A SOURCE OF SUPPLY FOR THE ITEM(S).